

# **Combined Heat & Power in Hospitals Webinar**

December 18, 2008  
Steven Jalowiec, PE, CHFM

# Presentation Goals

- Reasons for CHP
  - Hospital Specific Benefits
- Challenges
- System Overview
- Lessons Learned

# Reasons for CHP

- Utility Prices are making CHP more economically viable
  - Gas & oil markets unstable
  - Electric costs rising dramatically
  - Unpredictable markets for near future
- CHP is an alternative to control these costs
- CHP is green

# New financing arrangements are available

- Typical methods included self financing of capital improvements
  - Hospital owned & operated plant
  - Affected hospital debt equity
  - Hospitals typically have borrowed at low interest rates
- Off balance sheet financing
  - Recognized option by CFOs
  - Owned and operated by 3<sup>rd</sup> party
    - On hospital property
    - Land lease
  - Long term lease to hospital

# State and Federal Support for CHP

## Selected State and Federal incentives include

- Connecticut Incentives
  - Connecticut Clean Energy Fund (CCEF)
    - Project 150
    - Distributed Generation
      - Capital grants
      - Low interest loans
      - Discounts for the cost of natural gas
      - An exemption from certain electric costs for backup service
    - Energy Efficiency Improvements
- Massachusetts
  - Renewable Energy Trust
- Federal Tax Credit
  - Developers of CHP Plants

# Waterbury Hospital Fuel Cell CHP Project

- \$12.5M Hybrid CHP Project
- 2.4 Megawatts
  - HES
  - Emcor
  - FuelCell Energy fuel cell units
- Project 150 Grant Funded
  - Hospital receives thermal (steam) energy
  - Electricity sold to the grid
  - Land Lease
- Financed, owned & operated by 3<sup>rd</sup> Party
  - Grant benefits
  - Long term power purchase agreement
  - Federal tax credits for developer

➤ HES Owned “Project 100” Fuel Cell Plant (HED-FC): - Install 2.4 MW of Fuel Cell CHP plant to generate electricity to CL&P and 2800 lbs/hr steam to hospital, with hospital providing utility support services to project

### FuelCell Energy Direct FuelCell® Units

- molten carbonate type fuel cell



# Hospital Benefits from CHP

- Predictable energy costs
- Energy Supply Reliability
  - Natural and other disasters
  - National and regional grid stress
  - Reliability of national and local grids
  - Redundancy
- Environmental Benefits
  - Potential *clean/green* generation
  - Higher Efficiency of Generation Cycle
- Ability to run non-life critical systems
  - Comfort cooling

# Challenges

- Know and understand your energy profile
- Utility Distribution schematics
- Energy efficiency 1<sup>st</sup>
- Strategic facility plans
  - Long term
- Environmental regulatory status
- Local utility interconnection rules
- Legal issues/contract review support
- Local zoning
  - Property tax if not hospital owned
  - Connecticut Siting Council

# Lessons Learned

- All projects of this type take longer than you expect.

# Is My Facility a Good Candidate for CHP?

(Survey developed by the U.S. EPA CHP Partnership)

- Do you pay more than \$.06/ kWh on average for electricity (including generation, transmission and distribution)?
- Are you concerned about the impact of current or future energy costs on your business?
- Is your facility located in a deregulated electricity market?
- Are you concerned about power reliability? Is there a substantial financial impact to your business if the power goes out for 1 hour? For 5 minutes?
- Does your facility operate for more than 5000 hours/ year?
- Do you have thermal loads throughout the year (including steam, hot water, chilled water, hot air, etc.)?
- Does your facility have an existing central plant?

# Is My Facility a Good Candidate for CHP?

(Survey developed by the U.S. EPA CHP Partnership)

- Do you expect to replace, upgrade or retrofit central plant equipment within the next 3-5 years?
- Do you anticipate a facility expansion or new construction project within the next 3-5 years?
- Have you already implemented energy efficiency measures and still have high energy costs?
- Are you interested in reducing your facility's impact on the environment?
- Do you have access to on-site or nearby biomass resources (i.e. landfill gas, farm manure, food processing waste, etc.?)

***If you answered yes for 3 or more of the questions your facility may be a good candidate for CHP.***

# Contact Information

**Steven Jalowiec**

email: [SJalowiec@wtbyhosp.org](mailto:SJalowiec@wtbyhosp.org)

phone: (203) 573-7197